

Support for new claims 164, 165, 166, 167, 168, and 172 is found in original claims 48, 49, 50, 51, 54 and 81, respectively. Support for new claim 171 is found in original claims 62 and 80. Support for new claim 173 is found in original claims 28, 65 and 95. Support for new claim 174 is found in original claims 29 and 96. Support for claims 169 and 170 is found in the specification (page 20, line 7-10).

A clarifying amendment has been made to part (g) of claim 129. A mark-up of claim 129, showing the amendment, is contained in the Appendix hereto.

Respectfully submitted,

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APPENDIX: Mark-up of claims amended

129. (Twice Amended) A method of identifying a compound of interest in a library of compounds, each of said compounds being bound to a solid support and being produced by a unique reaction series composed of N reaction steps, wherein N is an integer of at least 2, and wherein each compound is produced from components which are independently the same or different, the method comprising:

- (a) dividing a population of solid support into M batches, wherein M is an integer greater than 1;
- (b) reacting each of the M batches of solid support with a component, so that the component forms a bond with the solid support;
- (c) adding to one or more batches, prior to (b), concurrently with (b), or subsequently to (b), one or more tag(s), each tag able to be attached to the solid support and able to be identified by optical interrogation, wherein said one or more tag(s) constitutes a code, which code is uniquely associated with a compound and a corresponding reaction sequence and is determined by optical interrogation;
- (d) recombining all of said M batches after (b) and (c);
- (e) repeating (a) to (d) for N-1 times, or repeating (a) to (d) for N-2 times followed by repeating (a) to (c) once, to produce a library of compounds;
- (f) performing an assay capable of indicating that any compound in the library has a property of interest; and

(g) decoding the code composed of one or more tag(s) to identify the compound associated with the code, wherein the decoding step is carried out without isolating the solid support comprising the compound having the property of interest from other solid supports and without detaching any of the tags(s) from the solid support comprising the compound having the property of interest, and wherein said decoding step comprises in-situ optical interrogation of the tag(s).